Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Please amend claim 1, 9, 11, 14, 15 and 18.

1. (Currently Amended) An electrolyte for a lithium secondary battery comprising:

a non-aqueous organic solvent; and

a sulfone based compound selected from the group consisting of methyl sulfone, phenyl sulfone, 4-fluorophenyl sulfone, benzyl sulfone, tetramethylene sulfone, butadiene sulfone, C_3 to C_4 alkenyl functional sulfones, and mixtures thereof;

where the sulfone based compound is present in an amount from 0.05 to 0.5 wt% on the basis of total weight of the electrolyte.

2. (Previously Presented) The electrolyte for a lithium secondary battery according to claim 1, wherein the sulfone based compound is present in an amount from 0.2 to 0.5 wt% on the basis of total weight of the electrolyte.

3. (Previously Presented) The electrolyte for a lithium secondary battery according to claim 2, wherein the sulfone based compound is present in an amount from 0.3 to 0.5 wt% on the basis of total weight of the electrolyte.

4. (Original) The electrolyte for a lithium secondary battery according to claim 1, wherein the non-aqueous organic solvent is a mixed solvent of a cyclic carbonate and linear carbonate

5. (Withdrawn) The electrolyte for a lithium secondary battery according to claim 1, wherein the non-aqueous organic solvent is a mixture of the carbonate solvents and aromatic hydrocarbon solvents of Formula (IV):

(IV)

wherein R1 is a halogen or a C_1 to C_{10} alkyl, and n is an integer from 0 to 6.

6. (Withdrawn) The electrolyte for a lithium secondary battery according to claim 5, wherein the aromatic hydrocarbon solvents are selected from the group consisting of benzene, chlorobenzene, nitrobenzene, fluorobenzene, toluene, trifluorotoluene, xylene and mixtures thereof.

7. (Withdrawn) The electrolyte for a lithium secondary battery according to claim 1, wherein the non-aqueous organic solvent is a mixture of cyclic carbonate, linear carbonate, and aromatic hydrocarbon solvents of Formula (IV), which are mixed in a volume ratio of 10-40: 40-80: 5-40:

(IV)

wherein R1 is a halogen or a C_1 to C_{10} alkyl, and n is an integer from 0 to 6.

8. (Original) The electrolyte for a lithium secondary battery according to claim 1, wherein the electrolyte further includes gamma butyrolactone in an amount from 10 to 30 parts per volume on the basis of 100 parts per volume of the non-aqueous organic solvent.

9. (Withdrawn - Currently Amended) An electrolyte for a lithium secondary battery comprising:

a non-aqueous organic solvent comprising cyclic carbonate, linear carbonate, and aromatic hydrocarbon solvents of Formula (IV), which are mixed in a volume ratio of 10-40: 40-80: 5-40;

(IV)

wherein R1 is a halogen or a C_1 to C_{10} alkyl, and n is an integer from 0 to 6;

gamma butyrolactone in an amount from 10 to 30 parts per volume on the basis of 100 parts per volume of the non-aqueous organic solvent; and

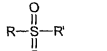
a sulfone based compound selected from the group consisting of methyl sulfone, phenyl sulfone, 4-fluorophenyl sulfone, benzyl sulfone, tetramethylene sulfone, butadiene sulfone, C3 to C4 alkenyl functional sulfones, and mixtures thereof in an amount from 0.05 to 0.5 wt% on the basis of total weight of the electrolyte.

10. (Previously Presented) The electrolyte for a lithium secondary battery according to claim 1, wherein the non-aqueous organic solvent comprises ethylene carbonate and a linear carbonate selected from the group consisting of dimethyl carbonate (DMC), diethyl carbonate (DEC), methylethyl carbonate (MEC) and mixtures thereof.

11. (Currently Amended) An electrolyte for a lithium secondary battery comprising:

a non-aqueous organic solvent; and

a sulfone based organic compound selected from the group consisting of methyl sulfone, phenyl sulfone, 4-fluorophenyl sulfone, benzyl sulfone, tetramethylene sulfone, butadiene sulfone, compounds represented by the following Formula (I), and mixtures thereof:



(I)

where R and R' are independently selected from the group consisting of C_3 to C_4 alkenyl groups, and halogen substituted alkenyl groups, wherein the sulfone based organic compound is present in an amount from 0.05 to 0.5 wt% on the basis of total weight of the electrolyte.

12. (Withdrawn - Previously Presented) The electrolyte for a lithium secondary battery according to claim 11, wherein the halogen is selected from the group consisting of fluoro, chloro, bromo, and iodo.

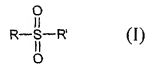
13. (Canceled).

14. (Withdrawn - Currently Amended) A lithium secondary battery comprising:

an electrolyte comprising a non-aqueous organic solvent and a sulfone based organic compound selected from the group consisting of methyl sulfone, phenyl sulfone, 4-fluorophenyl sulfone, benzyl sulfone, tetramethylene sulfone, butadiene sulfone, compounds represented by the following Formula (I), and mixtures thereof;

a positive electrode including lithium-transition metal oxides as a positive active material; and

a negative electrode including carbon, carbon composite, lithium metal, or lithium alloy as a negative active material:



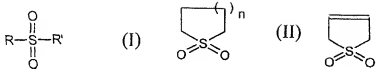
(I)

where R and R' are independently selected from the group consisting of C_3 to C_4 alkenyl groups, and halogen substituted alkenyl groups.

15. (Currently Amended) An electrolyte for a lithium secondary battery comprising:

a non-aqueous organic solvent; and

a sulfone based organic compound selected from the group consisting of methyl sulfone, phenyl sulfone, 4-fluorophenyl sulfone, benzyl sulfone, tetramethylene sulfone, butadiene sulfone, compounds represented by the following Formulae (I), (II), and (III), and mixtures thereof:



where R and R' are independently selected from the group consisting of primary alkyl groups, secondary alkyl groups, tertiary alkyl groups, aryl groups, C_3 to C_4 alkenyl groups; halogen substituted primary alkyl groups, halogen substituted secondary alkyl groups, halogen substituted tertiary alkyl groups, halogen substituted alkenyl groups, and halogen substituted aryl groups, and n is from 0 to 3, wherein the amount of the sulfone based organic compound is from 0.1 to 5 weight% based on the total amount of electrolyte.

16. (Withdrawn) The electrolyte for a lithium secondary battery according to claim 15, wherein the halogen is selected from the group consisting of fluoro, chloro, bromo, and iodo.

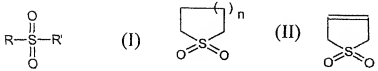
17. (Canceled).

18. (Withdrawn - Currently Amended) A lithium secondary battery comprising:

an electrolyte comprising a non-aqueous organic solvent and a sulfone based organic compound selected from the group consisting of methyl sulfone, phenyl sulfone, 4-fluorophenyl sulfone, benzyl sulfone, tetramethylene sulfone, butadiene sulfone, compounds represented by the following Formulae (I), (II), and (III), and mixtures thereof;

a positive electrode including lithium-transition metal oxides as a positive active material; and

a negative electrode including carbon, carbon composite, lithium metal, or lithium alloy as a negative active material:



where R and R' are independently selected from the group consisting of primary alkyl groups, secondary alkyl groups, tertiary alkyl groups, aryl groups, C_3 to C_4 alkenyl groups; halogen substituted primary alkyl groups, halogen substituted secondary alkyl groups, halogen substituted tertiary alkyl groups, halogen substituted alkenyl groups, and halogen substituted aryl groups, and n is from 0 to 3, wherein the amount of the sulfone based organic compound is from 0.1 to 5 weight% based on the total amount of electrolyte.